Indiana Department of Environmental Management
Office of Air Quality
Indianapolis, IN

Subject: Exceptional Events Flagging for Wildfire Event

Parameter: $PM_{2.5}$

Sites: Jeffersonville and New Albany

Dates: September 10-13, 2005

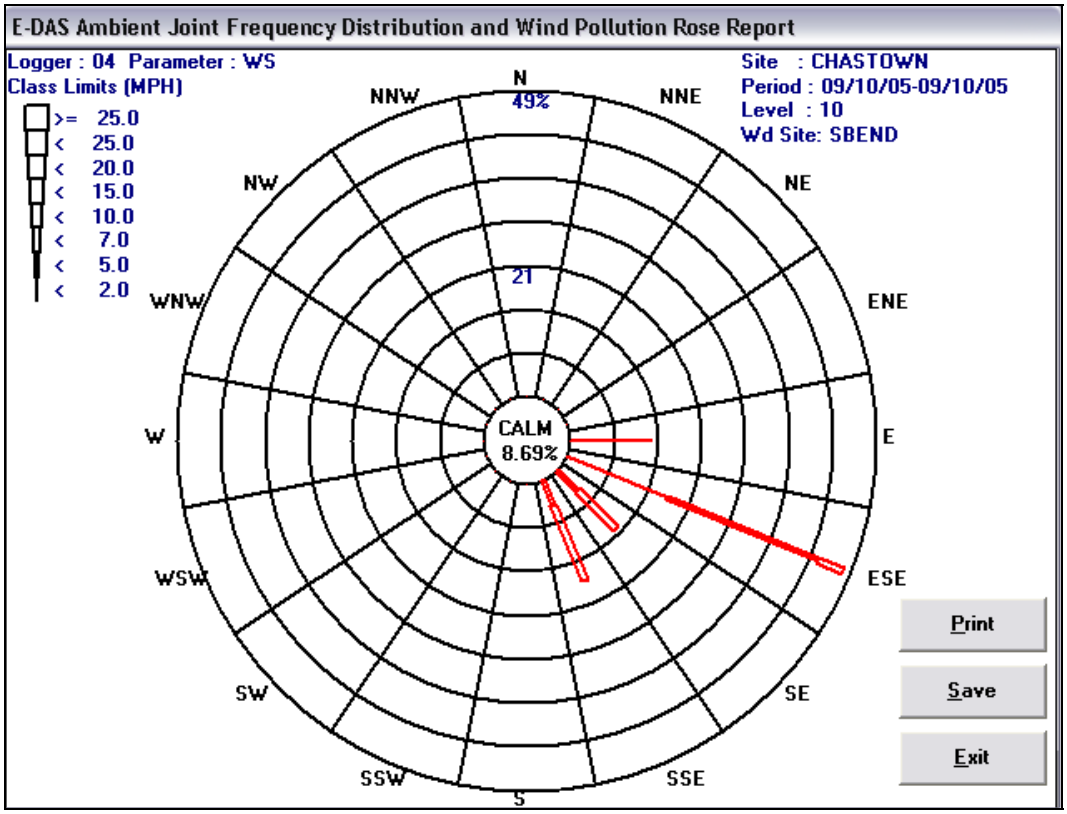
Reason: Smoke from wildfires in Arkansas, Mississippi and Texas impacted the Jeffersonville and New Albany sites on September 10 and 13, 2005. A front from the west and a front from the east caused by hurricane Ophelia effectively channeled smoke plumes into the area causing elevated levels of $PM_{2.5}$.

Data: Table 1 shows daily FRM averages prior to, during, and after the event. $PM_{2.5}$ concentrations during the event ranged from 40 to 45 ug/m^3. Values before and after were between 16 and 32 ug/m^3. The Wind Roses show the complex meteorology that occurred during this time period. The trajectory models show the air mass moving in from the northwest until the 10^{th} and then looping back from the south and southwest on the 11^{th} -13^{th}.

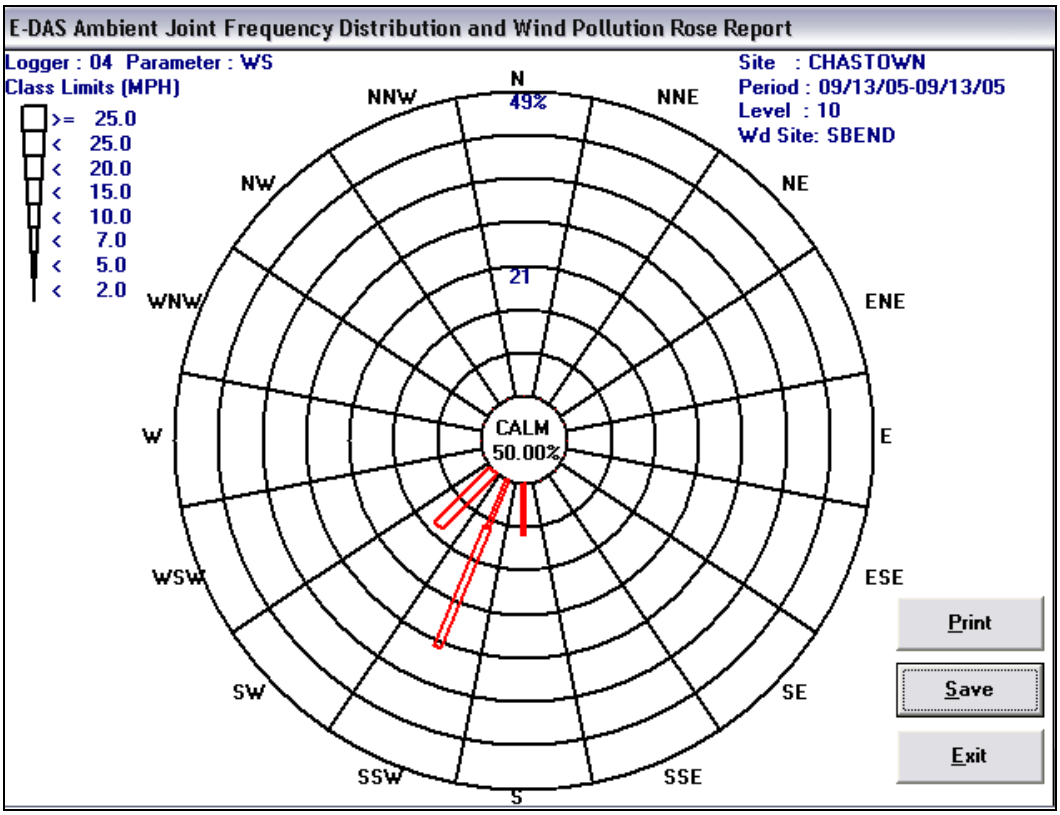
Maps: Images of maps from NOAA Satellite and Information Services show the smoke plume over the New Albany/Jeffersonville Metro Area as well as the channeling effects of the front from the west and hurricane Ophelia.

Table 1
FRM $PM_{2.5}$ 24-hour Averages

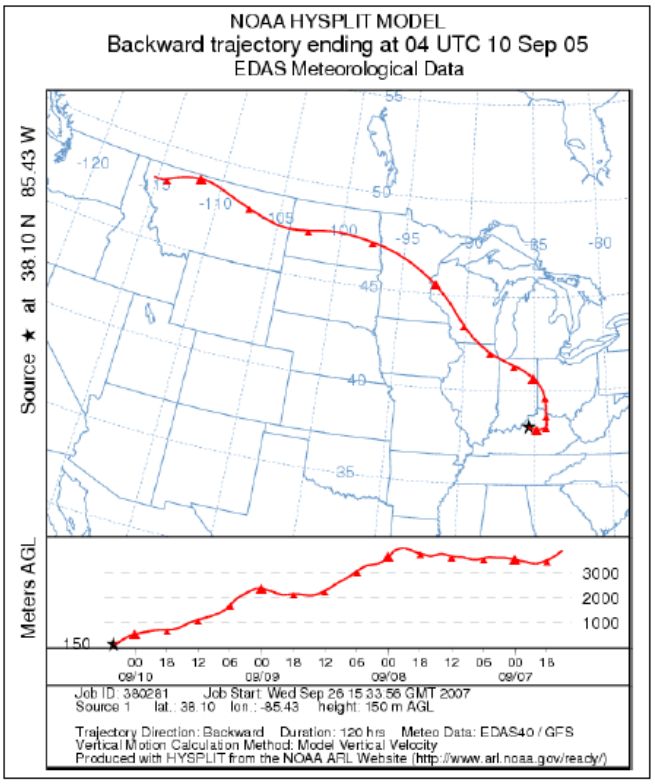
Date	New Albany 18-043-1004	New Albany (col) 18-043-1004	Jeffersonville 18-019-0006
09/07/05	28.3	29.4	32.1
09/10/05	**40.1**	no sample	**45.6**
09/13/05	**42.5**	**43.2**	**45.5**
09/16/05	16.7	no sample	16.7

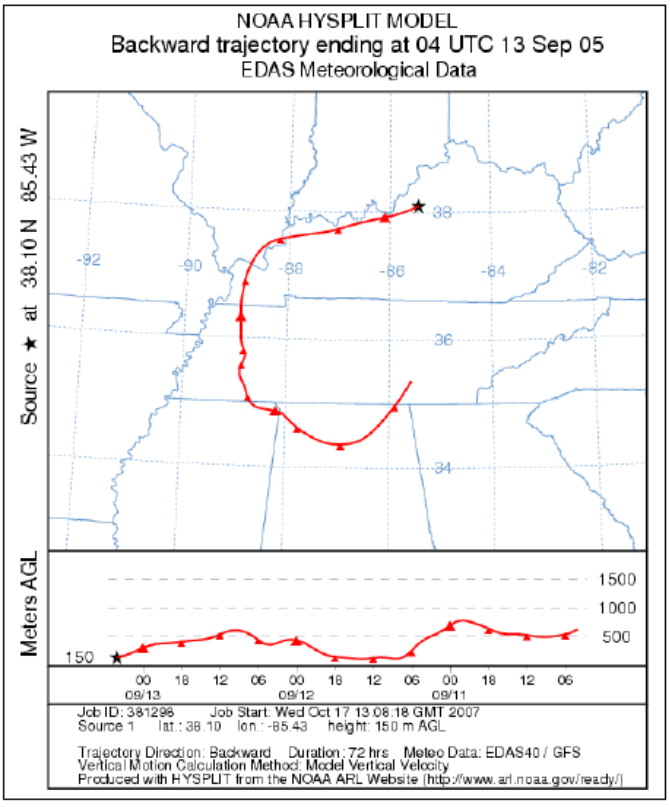


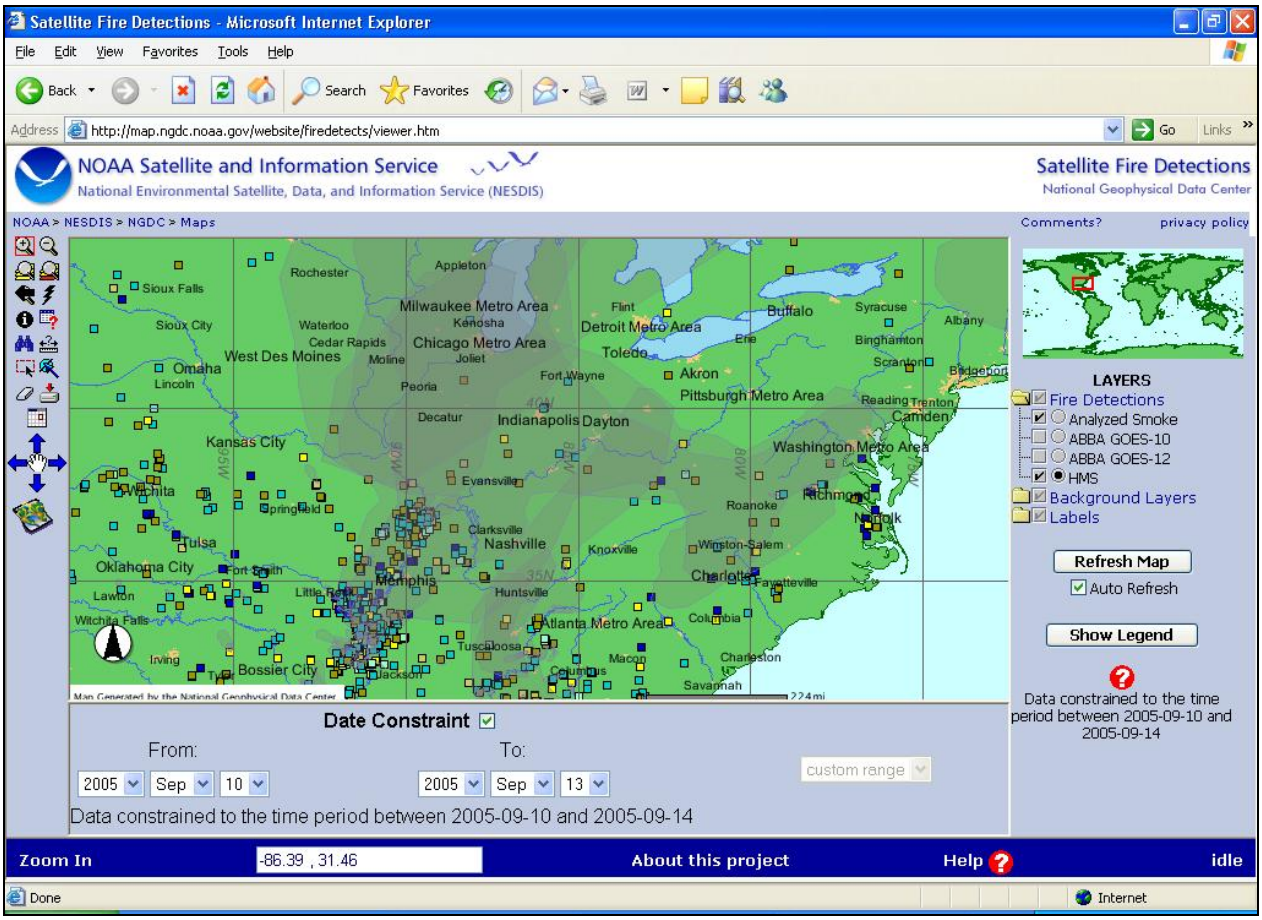
Wind rose from 09/10/05 shows the prevailing winds to be from the ESE, the primary direction of the smoke plume on that day (supported by trajectory model).



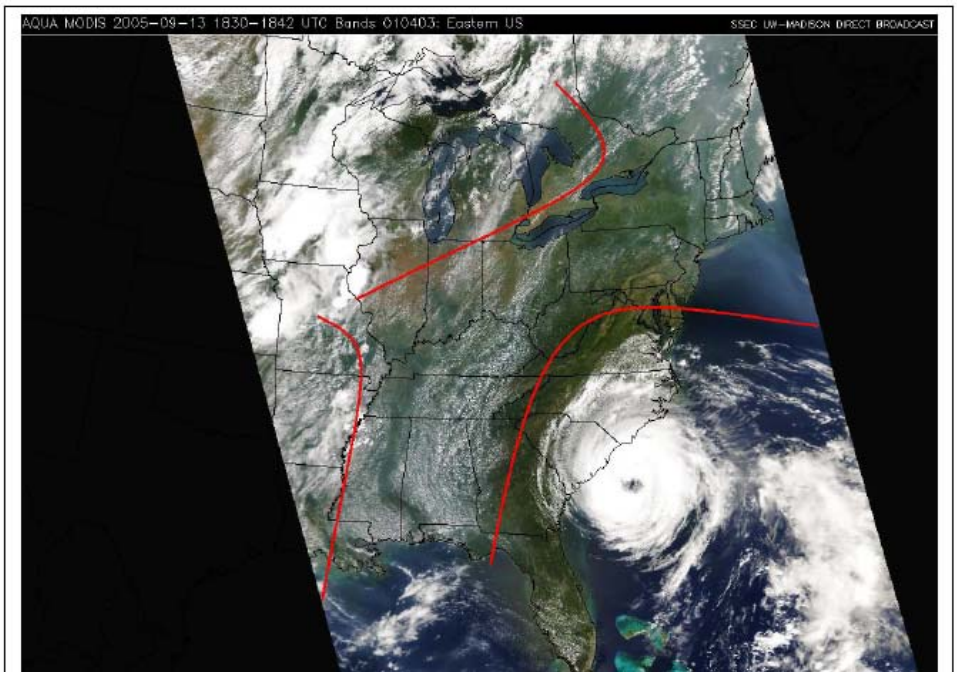
Wind rose from 09/13/05 shows the prevailing winds to be from the SSW, the primary direction of the smoke plume on that day (supported by trajectory model).


NOAA HYSPLIT MODEL
Backward trajectory ending at 04 UTC 10 Sep 05
EDAS Meteorological Data
Source ★ at 38.10 N 85.43 W
Meters AGL
3000
2000
1000
150
00 18 12 06 00 18 12 06 00 18 12 06 00 18
09/10 09/09 09/08 09/07
Job ID: 380261 Job Start: Wed Sep 26 15:33:56 GMT 2007
Source 1 lat.: 38.10 lon.: -85.43 height: 150 m AGL
Trajectory Direction: Backward Duration: 120 hrs Meteo Data: EDAS40 / GFS
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)


NOAA HYSPLIT MODEL
Backward trajectory ending at 04 UTC 13 Sep 05
EDAS Meteorological Data
Source ★ at 38.10 N 85.43 W
Meters AGL
1500
1000
500
150
00 18 12 06 00 18 12 06 00 18 12 06
09/13 09/12 09/11
Job ID: 381298 Job Start: Wed Oct 17 13:08:18 GMT 2007
Source 1 lat.: 38.10 lon.: -85.43 height: 150 m AGL
Trajectory Direction: Backward Duration: 72 hrs Meteo Data: EDAS40 / GFS
Vertical Motion Calculation Method: Model Vertical Velocity
Produced with HYSPLIT from the NOAA ARL Website (http://www.arl.noaa.gov/ready/)



Smoke map from 10/10/05 – 10/13/05 clearly shows the smoke coverage over the Jeffersonville/New Albany area.



Satellite image from September 13, 2005 shows the channeling effects of the front from the west and hurricane Ophelia keeping the smoke plume over the Midwest.